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A.D. 1883, 3rd APRIL. N° 1666.

Manufacture of Spirits.

LETTERS PATENT to Alexandre Manbré of N° 4 South Street, Finsbury, in the county of Middlesex, Brewer and Sugar Manufacturer for an Invention of "IMPROVEMENTS IN THE MANUFACTURE OF SPIRITS."

PROVISIONAL SPECIFICATION left by the said Alexandre Manbré at the Office of the Commissioners of Patents on the 3rd April 1883.

ALEXANDRE MANBRÉ of N° 4 South Street, Finsbury, in the county of Middlesex Brewer and Sugar Manufacturer "IMPROVEMENTS IN THE MANUFACTURE OF SPIRITS"

My invention relates to an improved process of producing or manufacturing whiskies and other spirits from malt and grain in which process the materials are treated in a manner that produces much better results than have hitherto been obtained from their use and the distilled spirits obtained are of much superior character as compared with those hitherto produced by the ordinary processes.

Hitherto it has been the practice to use in the manufacture of whiskies malt alone (by malt I mean germinated barley) and malt and unmalted grain (by unmalted grain I mean ungerminated grain) and other cereals and amylaceous substances. The process in use consists in crushing the malt and subjecting the meal and husk thus obtained to the process of saccharification by repeated mashings at a temperature varying from 140° to 200° Fahrenheit and the resulting saccharine solution called wort is then cooled, fermented and the spirit distilled off. When unmalted grain is used it is mixed with the malt and mashed together as above mentioned and the resulting saccharine solution or wort is likewise cooled, fermented and the spirit distilled off.

In the manufacture of grain spirit, unmalted grain chiefly maize, barley and rice are used as staple materials, and their conversion into saccharine solution is effected by means of malt and oats, the malt being used as a saccharifying agent and the oats as a filtering and flavouring medium.

[Price 4d.]

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In effecting the saccharification of the malt, unmalted grain and other amylaceous substances as it is now carried on, a portion of starch varying from 10 to 25 per cent (chiefly unmatured starch) remains unconverted and as a consequence the yield of spirit is relatively and proportionately less. Moreover the spirit produced is contaminated with an acrid empyreumatic flavour (called fusel oil) which lowers its quality and renders it unsuitable for immediate use. Hence the necessity of keeping it in store for a very long time to get matured or of subjecting it to the process of rectification (which considerably increases its cost of production) before being supplied to the trade. 5

A few attempts have been made to manufacture grain spirit by converting unmalted grain and other amylaceous substances into saccharine solution by means of acids (chiefly sulphuric acid) but as the dissolving action of the acid takes place on all the constituents of the starch at the same time including the empyreumatic fatty matters, it results that the saccharine solution produced is saturated with an acrid empyreumatic flavour (fusel oil) which is imparted to the distilled spirit and renders it unsuitable for immediate use. 10 15

Now, I have found that by employing my improved process of treating the materials employed and selecting the proper agents and heat I am enabled to obtain the conversion of the whole amount of starch these materials contain (whether matured or non-matured) into alcoholizable saccharine solution whereby I obtain an increased yield of from 10 to 25 per cent of spirit and free from fusel oil and as a consequence at a much lower cost of production and suitable for immediate use. 20

My improved process of manufacturing spirits is divided into three parts.

The first part has for its object the saccharification of the malt separately and in one operation or mashing and for that purpose I grind the malt into a fine meal and by preference I separate the husk or bran therefrom but this is not absolutely necessary I then take the meal (either with the husk or without it) and dilute it in the required quantity of water and subject the mixture to the action of heat varying from 130° to 175° Fahrenheit for about half an hour I then add to the mixture a compound consisting of phospho sulphate of lime or other analogous chemical agent which has for object to saccharify the unmatured starch and to neutralize the acrid empyreumatic matter and by subjecting the said mixture to an increased heat of from 230° to 260° Fahrenheit the saccharification of the whole amount of starch contained in the malt and the neutralization of the acrid empyreumatic matter will then be found effected. The saccharine solution thus obtained will then be ready to be subjected to alcoholizable fermentation for producing whiskies, Geneva and the like from malt alone or it may be mixed and fermented with saccharine solutions obtained from unmalted grain or other amylaceous substances as may be desired for producing malt flavoured spirits. 25 30 35

The second part of my process of manufacturing spirits has for its object the saccharification in one operation or mashing of unmalted grain or other amylaceous substances used as staple materials either by treating any one of them separately or a mixture of several of them as may be found most beneficial taking the use of maize meal as an illustration. 40

I take the maize meal either with the husk or without it and dilute it in the required quantity of water to which a compound consisting of phospho-sulphate of lime or other analogous chemical agent has been added. I then subject the mixture to the action of heat varying from 250° to 300° Fahrenheit when I obtain a complete conversion of the starch (matured and non matured) into saccharine solution as well as the neutralization of the acrid empyreumatic matter. The saccharine solution is then ready to be subjected to alcoholizable fermentation for producing neutral spirits or to be mixed and fermented with saccharine solutions obtained from malt alone for the purpose of obtaining malt flavoured spirit. 45 50 55

The third part of my process of manufacturing spirits has for its object the flavouring of the spirit—for that purpose instead of using the malt and oats in the mash tun jointly with the unmalted grain I use both meals in the fermenting

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vessel in which they are subjected to fermentation jointly with the saccharine solution; by so doing a great saving in the quantity of malt and oats used is effected.

From the foregoing it will be seen that by my improved process I can produce
5 three different kinds of spirit.

1^{stly} A full bodied neutral or unflavoured spirit specially adapted for immediate use in all purposes requiring neutral spirit.

2^{ndly} A full bodied flavoured spirit free from fusel oil specially adapted for immediate use in all purposes requiring flavoured spirit.

10 3^{rdly} Full bodied whiskies, Geneva and the like, specially adapted for immediate use by the trade.

Manbré's Improvements in the Manufacture of Spirits.

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said Alexandre Manbré in the Great Seal Patent Office on the 3rd October 1883.

ALEXANDRE MANBRÉ, of 4 South Street, Finsbury, in the county of Middlesex, Brewer and Sugar Manufacturer "IMPROVEMENTS IN THE MANUFACTURE OF SPIRITS"

My invention relates to an improved process of producing or manufacturing whiskies and other spirits from malt and grain in which process the materials are treated in a manner that produces much better results than have hitherto been obtained from their use and the distilled spirits obtained are of much superior character as compared with those hitherto produced by the ordinary processes. 10

Hitherto it has been the practice to use in the manufacture of whiskies, malt alone (by malt I mean germinated barley) and malt and unmalted grain (by unmalted grain I mean ungerminated grain) and other cereals and amylaceous substances. The process in use consists in crushing the malt and subjecting the meal and husk thus obtained to the process of saccharification by repeated mashings at a temperature varying from 140° to 200° Fahrenheit and the resulting saccharine solution called wort is then cooled, fermented and the spirit distilled off. When unmalted grain is used it is mixed with the malt and mashed together as above mentioned and the resulting saccharine solution or wort is likewise cooled, fermented and the spirit distilled off. 15 20

In the manufacture of grain spirit, unmalted grain chiefly maize, barley and rice are used as staple materials, and their conversion into saccharine solution is effected by means of malt and oats, the malt being used as a saccharifying agent and the oats as a filtering and flavouring medium. 25

In effecting the saccharification of the malt, unmalted grain and other amylaceous substances as it is now carried on, a portion of starch varying from 10 to 25 per cent (chiefly unmatured starch) remains unconverted and as a consequence the yield of spirit is relatively and proportionately less. Moreover the spirit produced is contaminated with an acrid empyreumatic flavour (called fusel oil) which lowers its quality and renders it unsuitable for immediate use. Hence the necessity of keeping it in store for a very long time to get matured or of subjecting it to the process of rectification (which considerably increases its cost of production) before being supplied to the trade. 30

Attempts have been made to manufacture grain spirit by converting unmalted grain and other amylaceous substances into saccharine solution by means of acids (chiefly sulphuric acid) but as the dissolving action of the acid takes place on all the constituents of the starch at the same time, including the empyreumatic fatty matters, it results that the saccharine solution produced is saturated with an acrid empyreumatic flavour (fusel oil) which is imparted to the distilled spirit and renders it unsuitable for immediate use. 35 40

Now, I have found that by employing my improved process of treating the materials employed and selecting the proper agents and heat I am enabled to obtain the conversion of the whole amount of starch these materials contain (whether matured or non-matured) into alcoholizable saccharine solution whereby I obtain an increased yield of from 10 to 25 per cent of spirit and free from fusel oil and as a consequence at a much lower cost of production and suitable for immediate use. 45

My improved process of manufacturing spirits is divided into three parts.

The first part has for its object the saccharification of the malt separately and in 50

Manbré's Improvements in the Manufacture of Spirits.

one operation or mashing and for that purpose I grind the malt into a fine meal and by preference I separate the husk or bran therefrom but this is not absolutely necessary. I then take the malt meal (either with the husk or without it) and dilute it in the required quantity of water which in practice is easily ascertained and subject the mixture to the action of heat varying from 130° to 175° Fahrenheit for about half an hour for effecting the saccharification of the matured starch. I then add to the mixture a compound consisting of phospho-sulphate of lime (or other equivalent chemical agent such as the phosphosulphates of soda or potash) which has for object to saccharify the unmatured starch and to neutralize the acrid empyreumatic matter and by subjecting the said mixture to an increased heat of from 230° to 260° Fahrenheit the saccharification of the whole amount of starch contained in the malt and the neutralization of the acrid empyreumatic matter will then be found effected. The saccharine solution thus obtained will then be ready to be subjected to alcoholizable fermentation for producing whiskies, Geneva and the like spirit from malt alone or it may be mixed and fermented with saccharine solutions obtained from unmalted grain or any other amylaceous substances, or saccharine solutions obtained from vegetables or fruits as may be desired for producing malt flavoured spirits. The proportions which I have found advantageous are from about one fourth of a pound to one pound of phospho-sulphate for every one-hundred pounds of malt meal treated.

The second part of my process of manufacturing spirits has for its object the saccharification in one operation or mashing of unmalted grain or other amylaceous substances used as staple materials either by treating any one of them separately or a mixture of several of them as may be found most beneficial, taking the use of maize meal as an illustration.

I take the maize meal either with the husk or without it and dilute it in the required quantity of water to which a compound consisting of phospho-sulphate of lime or other analogous chemical agent has been added. The proportions I find beneficial are from about one pound to five pounds of phospho sulphate to one hundred pounds of meal treated. I then subject the mixture to the action of heat varying from 250° to 300° Fahrenheit when I obtain a complete conversion of the starch (matured and non-matured) into saccharine solution as well as the neutralization of the acrid empyreumatic matter. The saccharine solution is then ready to be subjected to alcoholizable fermentation for producing neutral spirits or to be mixed and fermented with saccharine solutions obtained from malt alone for the purpose of obtaining malt flavoured spirit. This method of effecting the saccharification is not claimed separately as part of my present invention it having been described as a preparatory process in the specification of my former Letters Patent dated the 15th day of October 1881.

The third part of my process of manufacturing spirits has for its object the flavouring of the spirit—for that purpose instead of using the malt and oats in the mash tun jointly with the unmalted grain I use both meals in the fermenting vessel in which they are subjected to fermentation jointly with the saccharine solution; by so doing a great saving in the quantity of malt and oats used is effected.

From the foregoing it will be seen that by my improved process I can produce three different kinds of spirit.

Firstly. Full bodied flavoured whiskies, Geneva and the like spirits, specially adapted for immediate use by the trade.

Secondly. A full bodied neutral or unflavoured spirit specially adapted for immediate use in all purposes requiring neutral spirit.

Thirdly. A full bodied malt flavoured spirit free from fusel oil specially adapted for immediate use in all purposes requiring flavoured spirit.

Having thus described my invention of improvements in the manufacture of spirits and the manner of performing the same what I claim is:—

Firstly. The manufacture of full bodied flavoured whiskies, geneva spirit and the like from malt alone by the process hereinbefore described.

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Secondly. The manufacture of full bodied flavoured whiskies, geneva and the like from a mixture of saccharine solution obtained from malt by the process hereinbefore described mixed with a saccharine solution obtained from unmalted grain or from other amylaceous substances or vegetables or fruits as hereinbefore described.

Thirdly. The manufacture of full bodied neutral or unflavoured spirits from unmalted grain and other suitable amylaceous substances by the process hereinbefore described.

Fourthly. The manufacture of a full-bodied malt flavoured spirit free from fusel oil by the process hereinbefore described.

Fifthly. The use in the manufacture of spirits such as are herein mentioned of phospho sulphate of lime or its equivalent substantially as herein described.

In Witness whereof I the said Alexandre Manbré have hereto set my hand and seal this second day of October in the year of our Lord one thousand eight hundred and eighty three.

ALEXANDRE MANBRÉ (L.S.)

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For Her Majesty's Stationery Office.

1883.

*Mixes phospho-sulphate of
lime, soda, or potash
with or without such as*